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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/551,739 | 02/16/2006 | Tsuneo Maruyama | 6920/1087-US0 | 4286 |
| 76808 | 7590 | 11/16/2010 | | |
| Leason Ellis LLP 81 Main Street Suite 503 White Plains, NY 10601 | | | EXAMINER PILKINGTON, JAMES | |
| | | | ART UNIT 3656 | PAPER NUMBER |
| | | | MAIL DATE 11/16/2010 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/551,739 | Applicant(s) MARUYAMA ET AL. | |
| | Examiner JAMES PILKINGTON | Art Unit 3656 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 29, 2010 has been entered.

Claim Objections

Claim 10 is objected to because of the following informalities: “completely sintered” at the end of line 8 should be deleted to be grammatically correct. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Harris, USP 3,445,148.

Regarding claim 1, Harris discloses an oil-impregnated sintered bearing comprising: a bearing body (blank 50, finished product 52) made of a sintered metal (see column 4 lines 24-28) to support a rotating shaft by an inner surface thereof as a

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friction surface (column 5 lines 45-59 discloses that a shaft is supported by the bearing), said bearing body (52) having a bearing hole (central opening) therein; wherein the bearing hole includes a journal part (52b) that has a constant diameter, and enlarged diameter parts (at 52a) that are provided on both sides of the journal part (see Figure 3B) in the longitudinal direction thereof, respectively, so as to be connected with the journal part; and cavities (pores) exposed on an inner surface of the enlarged diameter part are smaller in size and fewer in number (52a is disclosed as having greater density and lower permeability, see column 5 lines 23-44, smaller and fewer pores results in a greater density and lower permeability) than those cavities exposed on an inner surface of the journal part (52b is disclosed as having a lower density and greater permeability, see column 5 lines 23-44, larger and a greater number of pores results in a lower density and greater permeability). It is also noted that Harris discloses the same pressing steps used to form the bearing as in the instant application including coining/pressing the ends of the blank, see column 5 lines 23-44, since Harris uses the same/similar method the resulting structure will have the ends of the bearing having a smaller pore size and fewer pores.

Regarding claim 10, Harris discloses an oil-impregnated sintered bearing which includes a bearing body (50/52) made of a sintered metal to support a rotating shaft (see column 4 lines 24-28 and column 5 lines 45-59), the bearing body (52) having a bearing hole (central opening) formed therein, the bearing hole including a journal part (52b) of which an inner surface as a friction surface has a constant diameter and enlarged diameter parts (52a) that are provided so as to be connected with the journal

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part and are formed in a tapered shape (see Figure 3b) having diameters to be enlarged toward the tips thereof, wherein the bearing hole that includes the journal part (52b) having a constant diameter is formed by pressing (see Figures 1a-1d) an inner circumferential surface of a cylindrical sintered body completely sintered; and the enlarged diameter parts (52a) so as to be connected with the journal part are formed by re-pressing (additional coining/pressing process, see column 5 lines 23-44) the inner circumferential surface of the cylindrical sintered body and cavities (pores) exposed on an inner surface of the enlarged diameter part are smaller in size and fewer in number (52a is disclosed as having greater density and lower permeability, see column 5 lines 23-44, smaller and fewer pores results in a greater density and lower permeability) than those cavities exposed on an inner surface of the journal part (52b is disclosed as having a lower density and greater permeability, see column 5 lines 23-44, larger and a greater number of pores results in a lower density and greater permeability). It is also noted that Harris discloses the same pressing steps used to form the bearing as in the instant application including coining/pressing the ends of the blank, see column 5 lines 23-44, since Harris uses the same/similar method the resulting structure will have the ends of the bearing having a smaller pore size and fewer pores.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris '148, in view of Tanaka, US PGPub 2002/0001420.

Regarding claims 2, 3 and 5, Harris discloses all of the claimed subject matter as applied to claim 1 above. Harris also discloses a taper angle with respect to the longitudinal direction of one enlarged diameter part which is provided on one side of the journal part, and a taper angle with respect to the longitudinal direction of the other enlarged diameter part, which is provided on the other side of the journal part are equal to each other (each side of 52 in Figure 3b has a taper).

Harris does not disclose a line obliquely extending along an inclined surface of one enlarged diameter part is arranged parallel to a line obliquely extending along an inclined surface of the other enlarged diameter part, and a distance between the lines is substantially equal to the diameter of the rotating shaft [claim 2]; a shortest distance between a line obliquely extending along an inclined surface of one of the enlarged diameter parts and the journal part across a middle axis of the bearing body is substantially equal to the diameter of the rotating shaft [claim 3] and wherein each of the enlarged diameter parts has taper angles which change stepwise with respect to a longitudinal direction of the enlarged diameter part such that the taper angle increases with increasing distance from the journal part [claim 5].

Tanaka teaches a bearing having a journal part (32) and enlarged diameter parts (33) on each end of the journal parts wherein a line obliquely extending along an inclined surface of one enlarged diameter part is arranged parallel to a line obliquely extending along an inclined surface of the other enlarged diameter part, and a distance

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between the lines is substantially equal to the diameter of the rotating shaft (paragraphs 0040-0042, surfaces 33 are sized to support the shaft even when inclined); wherein a shortest distance between a line obliquely extending along an inclined surface of one of the enlarged diameter parts (33) and the journal part facing across a middle axis of the bearing body is substantially equal to the diameter of the rotation shaft (the distance between an oblique line from surface 33 to the center of the journal surface 32 on the opposite side of the bearing is substantially equal to the diameter of the rotating shaft so that the shaft can shift within the bearing, see Figures 10 and 12); and wherein each of the enlarged diameter parts has taper angles which change stepwise (first surface 33 and additional taper at the openings, see Figure 10) with respect to a longitudinal direction of the enlarged diameter parts such that the taper angle increase with increasing distance from the journal part, for the purpose of sizing the enlarged diameters of the bearing so that they can support the shaft when the shaft is inclined relative to the axis of the bearing to increase the lifetime of the bearing (column 4 lines 37-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Harris and provide a bearing with a journal part and enlarged diameters parts that has a line obliquely extending along an inclined surface of one enlarged diameter part is arranged parallel to a line obliquely extending along an inclined surface of the other enlarged diameter part, and a distance between the lines is substantially equal to the diameter of the rotating shaft [claim 2]; a shortest distance between a line obliquely extending along an inclined surface of one of the enlarged

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diameter parts and the journal part across a middle axis of the bearing body is substantially equal to the diameter of the rotating shaft [claim 3] and wherein each of the enlarged diameter parts has taper angles which change stepwise with respect to a longitudinal direction of the enlarged diameter part such that the taper angle increases with increasing distance from the journal part [claim 5], as taught by Tanaka, for the purpose of providing a bearing that can support a shaft when the shaft is inclined relative to the axis of the bearing to increase the lifetime of the bearing.

Regarding claim 6, Harris in view of Tanaka discloses all of the claimed subject matter as applied above.

Harris does not that the taper angles with respect to the longitudinal direction of the enlarged diameter parts are 3° or less with respect to the journal portion or adjacent enlarged diameter parts.

Since the applicant is silent to any criticality or unexpected results from having the angle set at 3 degrees or less it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Harris and provide an angle of 3 degrees or less since the device of would perform perfectly well with any acute angle, the particular angle of 3 degrees is a matter of design choice. The amount of the angle provides the predictable result of limiting of movement within the shaft and one of ordinary skill in the art would design the bearing with the appropriate angle to limit the range of movement based on the application of the bearing.

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Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harris '148.

Harris discloses all of the claimed subject matter as applied to claim 1 above.

Harris does not that the taper angles with respect to the longitudinal direction of the enlarged diameter parts are 3° or less with respect to the journal portion or adjacent enlarged diameter parts.

Since the applicant is silent to any criticality or unexpected results from having the angle set at 3 degrees or less it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Harris and provide an angle of 3 degrees or less since the device of would perform perfectly well with any acute angle, the particular angle of 3 degrees is a matter of design choice. The amount of the angle provides the predictable result of limiting of movement within the shaft and one of ordinary skill in the art would design the bearing with the appropriate angle to limit the range of movement based on the application of the bearing.

Response to Arguments

Applicant's arguments with respect to claims 1-6 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Regarding Applicant's remarks that Tanaka does not explicitly nor implicitly disclose any geographical relationship like that disclosed in claims 2 and 3. The geographical relationships in which the Applicant is arguing are related to the taper of the enlarged diameter parts. Tanaka discloses that the bearing can support an inclined shaft because of the tapered sides. Since the tapered sides are symmetrical between

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the two ends, extension lines of the tapered surfaces on opposite ends will be parallel and a distance between these lines will be substantially equal to the diameter of the shaft so that it can pivot without contacting one tapered side before the other.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES PILKINGTON whose telephone number is (571)272-5052. The examiner can normally be reached on Monday - Friday 7-3.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAMES PILKINGTON/
Examiner, Art Unit 3656
11/15/10

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